

Dates of first light and heavy frosts and snow—Continued.

State and station.	First frost.			State and station.	First frost.		
	Light.	Heavy.	Snow.		Light.	Heavy.	Snow.
Texas—Continued.				Virginia—Continued.			
Dallas	27			Irwin		30	
Devine	28			Lexington		17	
Eastland	2	25		Lynchburg	16	30	
El Paso	3			Marion		30	
Gainesville	12	26		Nottoway		30	
Graham	13	27		Richmond	16	17	
Grapevine	13	27		Salem	16	29	
Hale City		12		Spottsville	16	17	
Hartley	2	12		Stanardsville		30	
Haskell		26		Staunton		17	
Highland	3	27		Stephens City	2	28	
Longview	15			Woodstock		16	
Mesquite	3	27		Wytheville		16	
Mountain Spring	15	27		Washington.			
Palestine	16			Aberdeen		22	
Paris	15			Anacortes		22	
Roby		26		Blaine		14	31
Silver Falls	15	25		Bridgeport		9	
Sulphur Springs		29		Centerville			31
Utah.				Chelan		21	
Castle Gate			1	Colfax		23	
Heber			12	East Clallam		18	
Moab		5		Fort Canby		23	31
Vermont.				Fort Townsend		19	31
Burlington		19	29	Madrone		23	31
Cornwall		19		Neah Bay		22	
Enosburg Falls		29	29	Oiga	17	23	31
Hartland		29	29	Olympia		23	
Irassburg		29	29	Pine Hill		13	
Jacksonville		15	29	Port Angeles		23	31
Northfield		29	29	Port Crescent			31
Norwich		29	29	Pullman		13	
Stratford		16		Pyshht	13	18	31
Vernon		17		Rosalia			10
Wells		11		Seattle	18	23	31
Woodstock		29		Silver Creek			31
Virginia.				Spokane			22
Ashland		16		Tacoma		23	
Avon		30		Tatoosh Island	23		
Bedford City	16	30		Union City		23	
Big Stone Gap	16	29		Vashon		22	31
Birdanest		18		West Ferndale		13	
Blacksburg		17		West Virginia.			
Charlottesville	3	30		Elkhorn		16	
Christiansburg		28		Ella		31	
Dale Enterprise		17		Glenville		31	
Danville	16			Kingwood			28
Falls Church		17		Marlinton	16	17	
Fredericksburg		17		Morgantown			29
Hampton	17			New Martinsville	16	31	

Dates of first light and heavy frosts and snow—Continued.

State and station.	First frost.			State and station.	First frost.		
	Light.	Heavy.	Snow.		Light.	Heavy.	Snow.
West Virginia—Cont'd.				Wisconsin—Continued.			
Nuttallburg		29		Green Bay			28
Parkersburg			29	Hayward			14
Pleasant Hill			28	Hillsboro			28
Point Pleasant		31		Koepenick			25
Rowlesburg			29	La Crosse			1
Weston			29	Medford			25
Wheeling			29	Milwaukee		15	
Wisconsin.				Oscola			14
Ashland			24	Stevens Point			28
Belleville			28	Viroqua			28
Butternut			25	Weston			25
City Point			25	Wyoming.			
Columbus			28	Cheyenne			1
Crandon			26	Laramie			11
Estella			24	Saratoga			1
Florence			26	Sheridan			1
Grantsburg			11	Sundance			1

PERIODS OF HIGH TEMPERATURE.

The most interesting period of high temperature is that which includes the 8th to the 12th. During the first of these dates the maximum temperature of the month occurred in the south plateau region, the Southwest, and the central slope. On the 9th it occurred in western Missouri and along the middle and east Atlantic coasts. On the 10th the maxima of the month occurred in Wisconsin and Georgia, on the 11th in Ohio and the central Gulf states, and on the 12th over Lakes Erie and Ontario. There was, therefore, only a very general and indefinite movement of this warm wave eastward in connection with the area of clear weather.

PERIODS OF COLD WEATHER.

The minimum temperatures for the month occurred in Colorado and Wyoming on the 26th, and in Texas and the Southwest on the 27th or 28th. This area of low temperature extended eastward, covering Illinois and the Lake region on the 30th and the entire Atlantic states on the 31st.

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for October, 1893, as determined by reports from about 2,000 stations, is exhibited on Chart III. In the table of climatological data the total precipitation and the departure from the normal are given for regular stations of the Weather Bureau. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above.

The normal precipitation for October is generally less than for September; it is greatest along the north Pacific coast and on the east coast of southern Florida where it exceeds 6. In the Rocky Mountain and plateau regions the precipitation for October is usually less than 1, and diminishes to zero as we go southward to the lower Colorado valley, but increases rapidly as we go northwest into Oregon.

In October, 1893, the monthly precipitation was 4 to 5 on the immediate coast of extreme northern California and of Oregon, and increased toward the north to 8 and 10 in the neighborhood of Tatoosh Island, but diminished rapidly on going eastward from the coast, and was less than 1 for the interior of Washington and eastern Oregon. Little or no precipitation was reported from the interior of California, Nevada, Utah, Arizona, New Mexico, Texas, and Indian Territory, and less than 0.5 from Colorado, Kansas, Nebraska,

western Missouri, and Iowa. The heaviest rainfall occurred on the eastern coast of Florida and the eastern coast of the south Atlantic states.

DEPARTURES FROM NORMAL PRECIPITATION.

Rainfall was in excess of the normal at Titusville, Fla., 3.0; at Mobile, Ala., 5.3; Charleston, S. C., and Savannah, Ga., 3.1; Charlotte, N. C., 4.4; Lynchburg, Va., 4.8; Cairo, Ill., 3.3; and to a less extent at most stations in the central lake region, the Ohio Valley, and the middle and south Atlantic states. Precipitation was also slightly in excess in Montana, Washington, Oregon, and neighboring Canadian stations. A slight deficiency of precipitation was reported from all other regions, the maximum deficit being in Texas, where the departures below the normal were as follows: Abilene, 3.0; Palestine, 3.6; Galveston, 4.4; Corpus Christi, 3.1.

Considered by districts the percentages of monthly precipitation for October, 1893, as compared with the normal for the month, are as follows:

In districts where the precipitation was in excess, the average percentage of the normal was as follows: northern plateau, 166; north Pacific coast, 122; eastern Gulf states, 110; middle Atlantic states, 106; lower lake region, 106; northern slope, 100; Ohio Valley and Tennessee, 93; upper lake region, 88; middle Pacific coast, 88; south Atlantic states, 80; Key West, Fla., 71; New England, 68; extreme northwest, 63; upper Mississippi valley, 55; middle plateau, 47; south

Pacific coast, 42; middle slope, 34; Missouri Valley, 21; western Gulf states, 20; southern plateau, 8; southern slope, 2.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for October for a series of years; (2) the length of record during which the observations have been taken and from which the average has been computed; (3) the total precipitation for October, 1893; (4) the departure of the current month from the average; (5) and the extremes for October during the period of observation and the years of occurrence:

State and station.	(1) Average for the month of Oct.	(2) Length of record.	(3) Total for Oct., 1893.	(4) Departure from average.	(5) Extremes for October.			
					Greatest.		Least.	
					Am't.	Year.	Am't.	Year.
<i>Arizona.</i>	<i>Inches.</i>	<i>Years.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>		<i>Inches.</i>	
Fort Apache.....	1.26	17	0.04	- 1.22	4.68	1881	0.00	1878, 1891
Fort Mohave.....	0.25	21	0.02	- 0.23	2.00	1874	0.00	*
Whipple Barracks.....	0.69	22	0.15	- 0.54	1.76	1889	0.00	*
<i>Arkansas.</i>								
Keesees Ferry.....	4.05	12	0.92	- 3.13	18.11	1883	0.10	1886
<i>California.</i>								
Riverside.....	0.31	13	.....	.....	1.28	1889	0.00	1886, 1891
<i>Colorado.</i>								
Las Animas.....	0.51	12	0.02	- 0.49	1.19	1885	0.02	1893
<i>Florida.</i>								
Merritts Island.....	5.45	15	9.14	+ 3.69	11.94	1886	1.33	1889
<i>Georgia.</i>								
Forsyth.....	2.71	19	2.55	- 0.16	7.86	1879	T.	1891
<i>Idaho.</i>								
Boise Barracks.....	0.98	20	0.84	- 0.14	4.06	1883	0.02	1891
Fort Sherman.....	1.70	10	5.50	+ 3.80	5.50	1893	0.59	1882
<i>Indiana.</i>								
Lafayette.....	2.43	11	1.57	- 0.86	5.56	1883	0.73	1886
<i>Iowa.</i>								
Cresco.....	2.31	22	3.40	+ 1.09	8.06	1881	0.13	1889
<i>Kansas.</i>								
Independence.....	2.88	21	0.25	- 2.63	7.16	1883	0.19	1874
<i>Louisiana.</i>								
Grand Coteau.....	2.32	10	2.67	+ 0.35	4.98	1890	T.	1889
<i>Maine.</i>								
Orono.....	4.09	22	3.34	- 0.75	7.51	1888	1.09	1882
<i>Maryland.</i>								
Cumberland.....	2.33	22	4.37	+ 2.04	6.65	1890	0.00	1879
<i>Michigan.</i>								
Kalamazoo.....	2.74	17	3.08	+ 0.34	6.57	1881	0.31	1892
<i>Missouri.</i>								
Sedalia.....	2.82	15	0.88	- 1.94	7.07	1883	0.51	1878
<i>Montana.</i>								
Fort Custer.....	1.31	14	0.45	- 0.86	4.60	1891	0.24	1885
<i>Nebraska.</i>								
Fort Robinson.....	1.82	10	0.46	- 1.36	8.60	1887	T.	1888
Genoa (near).....	1.60	17	0.49	- 1.11	3.48	1891	0.25	1879
<i>Nevada.</i>								
Browns.....	0.38	21	.....	.....	1.36	1884	0.00	*
Carson City.....	0.41	16	0.15	- 0.26	1.61	1882	T.	*
<i>New Hampshire.</i>								
Hanover.....	3.33	22	3.00	- 0.33	5.57	1873	0.53	1876
<i>New Mexico.</i>								
Deming.....	0.86	11	0.00	- 0.86	2.13	1887	0.00	*
Fort Wingate.....	0.94	22	0.00	- 0.94	2.75	1872	0.00	*
<i>New York.</i>								
Cooperstown.....	3.28	22	1.27	- 2.01	5.91	1890	1.19	1887
Plattsburg Barracks.....	2.47	22	0.85	- 1.62	5.15	1873	0.46	1879
<i>North Carolina.</i>								
Lenoir.....	3.17	22	8.30	+ 5.13	9.50	1885	T.	1892
<i>Oklahoma.</i>								
Fort Reno.....	3.72	10	0.00	- 3.72	6.82	1883	0.00	1893
Fort Sill.....	2.68	21	0.00	- 2.68	8.02	1877	0.00	1893
Fort Supply.....	1.45	13	0.00	- 1.45	4.99	1889	0.00	*
<i>Oregon.</i>								
Bandon.....	5.02	15	11.38	+ 6.36	11.80	1889	1.16	1880
<i>Pennsylvania.</i>								
Dyberry.....	3.36	22	2.17	- 1.19	7.39	1890	0.82	1892
Grampian.....	2.91	16	2.62	- 0.29	6.36	1890	0.59	1892
Wellshoro.....	3.34	14	2.88	- 0.46	7.50	1885	0.33	1892
<i>South Carolina.</i>								
Statesburg.....	2.70	12	4.68	+ 1.98	8.15	1887	0.02	1884
<i>South Dakota.</i>								
Fort Sully.....	0.52	22	3.00	+ 2.48	3.00	1893	0.02	1872
<i>Texas.</i>								
Austin.....	2.48	21	0.00	- 2.48	8.06	1871	0.00	1893
Silver Falls.....	2.43	7	0.05	- 2.38	3.63	1892	0.05	1893
<i>Utah.</i>								
Terrace.....	0.17	19	0.00	- 0.17	0.75	1889	0.00	*
<i>Vermont.</i>								
Stratford.....	3.21	20	2.65	- 0.56	6.80	1873	1.20	1882
<i>Virginia.</i>								
Dale Enterprise.....	2.94	13	6.18	+ 3.24	12.60	1885	0.19	1892
<i>Washington.</i>								
Fort Townsend.....	1.94	17	1.87	- 0.07	3.58	1875	1.00	1885
<i>West Virginia.</i>								
Parkersburg.....	2.14	8	4.48	+ 2.34	4.95	1888	0.61	1887
<i>Wisconsin.</i>								
Madison.....	2.67	22	1.85	- 0.82	9.12	1881	T.	1889
<i>Wyoming.</i>								
Fort Washakie.....	1.31	10	0.18	- 1.13	3.50	1891	0.18	1893

* Frequently.

PRECIPITATION, JANUARY TO OCTOBER.

For the period January to October, 1893, inclusive, the total precipitation was in excess over the northern Pacific coast region and the northern, middle, and southern plateau regions by about 15 per cent of its normal value. Over the rest of the United States the total precipitation was deficient.

The percentages of the precipitation for the current year, as compared with the normal, were as follows, for each district:

In districts where the precipitation was in excess, the average percentage of the normal was as follows: Northern plateau, 129; north Pacific coast, 119; southern plateau, 112; middle plateau, 106.

In districts where the precipitation was deficient the percentage of the normal was as follows: Ohio Valley and Tennessee, 98; middle Atlantic states, 97; lower lake region, 94; middle Pacific coast, 92; New England, 92; south Atlantic states, 92; extreme northwest, 91; upper Mississippi valley, 89; Missouri Valley, 88; upper lake region, 88; east Gulf states, 85; southern Pacific coast, 80; northern slope, 76; southern slope, 72; west Gulf states, 69; middle slope, 62; Key West, 57.

YEARS OF GREATEST PRECIPITATION FOR OCTOBER.

The precipitation for the current month is the largest on record at regular stations of the Weather Bureau as follows: at Mobile, Ala., being 8.56, or 5.3 above the normal—the highest preceding was 7.32 in 1880; at Charlotte, N. C., being 8.27, or 4.4 above the normal—the highest preceding being 4.92 in 1892. In general the greatest precipitation for October was noted on the middle and south Pacific coasts in 1889; in an area extending from Maryland over eastern Tennessee and the interior of North Carolina in 1885; from the lower Missouri over the middle Mississippi and middle Ohio valleys in 1883; from the middle Missouri over the Red River of the North Valley in 1882; from the upper Mississippi valley over Lower Michigan in 1881; and from eastern Pennsylvania over eastern New York and southern New England in 1877.

YEARS OF LEAST PRECIPITATION FOR OCTOBER.

The precipitation for the current month is the least ever reported for October at regular stations of the Weather Bureau as follows: San Antonio, Tex., being 0.08, or 1.9 below the normal—the lowest preceding was 0.56 in 1878; similar data for other stations are given in the following table:

Station.	October, 1893.	Departure from normal.	Least.	
			Amount.	Year.
	<i>Inches.</i>	<i>Inches.</i>	<i>Inch.</i>	
Abilene, Tex.....	0.03	-3.0	0.60	1891
Fort Stanton, N. Mex.....	1.04	-1.5	0.12	1891
Springfield, Ill.....	0.16	-3.3	0.80	1886
Des Moines, Iowa.....	2.22	-3.4	0.52	1889
Leavenworth, Kans.....	0.48	-2.8	0.72	1875
Concordia, Kans.....	0.14	-1.5	0.78	1890
Omaha, Nebr.....	0.12	-2.5	0.34	1889
North Platte, Nebr.....	0.05	-1.1	0.13	1878
Valentine, Nebr.....	0.23	-1.0	0.27	1886
Huron, S. Dak.....	0.19	-1.2	0.29	1888

In general the least precipitation for October was noted from the northeast slope of the Rocky Mountains over the Red River of the North and extreme upper Mississippi valleys in 1889; over the greater part of New York in 1882; over the greater part of Kansas, Oklahoma, and Indian Territory in 1879; and from western Pennsylvania over Maryland and Virginia, and in the lower Mississippi valley in 1874.

EXCESSIVE PRECIPITATION.

The following tables for October, 1893, show, by states, the number of stations reporting total precipitation to equal or

exceed 10.00 during the month; 2.50 in 24 hours; and 1.00 in 1 hour:

Monthly precipitation to equal or exceed 10.00.

State.	Number of stations.	State.	Number of stations.
Florida.....	2	Virginia.....	1
North Carolina.....	2	Washington.....	1
Oregon.....	2		

Precipitation to equal or exceed 2.50 in 24 hours.

State.	Number of stations.	Dates.	State.	Number of stations.	Dates.
Ohio.....	39	3, 13, 13-14, 14.	Kentucky.....	6	2, 2-3, 3, 14.
South Carolina.....	26	3-4, 12-13, 13, 21-22, 22, 22-23.	West Virginia.....	6	13, 13-14.
North Carolina.....	17	12-13, 13, 13-14, 21, 21-22, 22.	Louisiana.....	5	1-2, 5.
Alabama.....	16	1-2, 2-3.	New Hampshire.....	5	23-24.
Florida.....	14	2, 2-3, 11-12, 12, 12-13, 20, 24.	Pennsylvania.....	5	13-14, 22-23.
Virginia.....	14	12-13, 13, 13-14, 21-22, 22.	Wisconsin.....	5	2, 5-6, 6.
Oregon.....	13	7, 8.	Maine.....	4	23-24.
Georgia.....	11	2-3, 3, 12, 12-13.	Massachusetts.....	2	23-24.
Connecticut.....	7	13-14, 14, 22-23, 23, 23-24.	Mississippi.....	2	1-2.
New Jersey.....	7	22-23, 23, 23-24, 27-28.	Rhode Island.....	2	23-24.
Indiana.....	7	2-3, 3, 13, 25.	Washington.....	2	7, 10-11.
Maryland.....	7	13, 13-14, 23.	California.....	1	8.
Illinois.....	6	2, 11-12, 12-13, 25-26.	Dist. of Columbia.....	1	13-14.
			Iowa.....	1	5-6.
			Minnesota.....	1	5.
			Missouri.....	1	12.
			New York.....	1	22-23.
			Texas.....	1	1-2.

Precipitation to equal or exceed 1.00 in 1 hour.

Louisiana.....	5	1, 5.	Iowa.....	1	1.
Florida.....	3	2, 24.	Missouri.....	1	1.
Georgia.....	1	3.	South Carolina.....	1	3.

Table of excessive precipitation, October, 1893.

State and station.	Monthly rainfall to inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Alabama.	Inches.	Inches.		Inches.	h. m.	
Bermuda.....	4.00	2				
Brewton.....	5.95	2				
Chilborne Landing.....	5.40	2				
Elba.....	4.60	1-2				
Enfauac.....	2.94	2				
Evergreen.....	5.03	3				
Fort Deposit.....	3.55	1-2				
Geneva.....	3.75	2				
Healing Springs.....	7.47	1-2				
Mobile.....	3.85	2-3				
Mount Willing.....	3.90	2				
Newton.....	3.85	2				
Starlington.....	3.90	2-3				
Thomasville.....	2.87	2-3				
Union Springs a.....	3.25	2-3				
Union Springs b.....	3.25	2-3				
California.						
Crescent City.....	2.55	8				
Connecticut.						
Bridgeport.....	2.54	22-23				
Colchester.....	2.65	13-14				
Do.....	2.50	23-24				
Greenfield Hill.....	2.93	23-24				
Lebanon.....	2.60	23-24				
North Franklin.....	2.63	23				
Storrs.....	2.63	14				
Voluntown.....	2.58	2-24				
Dist. of Columbia.						
Receiving Reservoir.....	2.53	13-14				
Florida.						
Eustis.....	4.12	11-12		1.10	1 00	2
Federal Point.....	4.12	11-12		1.52	1 35	2
Gainesville.....	4.35	12				
Grasmere.....	2.95	12				
Green Cove Springs.....	3.10	20				
Homeland.....	2.99	12-13		2.05	1 00	24
Jacksonville.....	4.35	24				
Jupiter.....	11.72	24				
Kissimmee.....	4.38	11-12				
Merritts Island.....	4.14	12				
Moseley Hall.....	2.65	2-3				
New Smyrna.....	10.02	12				

Table of excessive precipitation—Continued.

State and station.	Monthly rainfall to inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Florida—Continued.	Inches.	Inches.		Inches.	h. m.	
Orange City.....	4.55	12				
Pensacola.....	2.51	2				
Saint Francis Barracks.....	4.40	11-12				
Titusville.....	3.52	11-12				
Georgia.						
Augusta.....	2.70	12-13				
Columbus.....	2.52	2-3				
Darien.....	3.70	12-13				
Fort Gaines.....	3.10	2-3				
Hephzibah.....	2.80	12				
Louisville.....	4.02	12-13				
Lumpkin.....	2.61	2-3				
Macon b.....	2.51	2-3				
Savannah.....	2.69	3		1.52	1 00	3
Do.....	3.99	12-13				
Talbotton.....	3.20	2-3				
Way Cross.....	2.59	12-13				
Illinois.						
Aurora.....	2.65	2				
Cairo.....	2.67	12-13				
Golconda.....	2.55	25-26				
Jordans Grove.....	5.00	11-12				
Mascoutah.....	2.80	12				
Rockford.....	2.69	2				
Indiana.						
Butlerville.....	2.69	3				
Columbus.....	2.92	3				
Evansville.....	2.50	2-3				
Huntingburg.....	3.00	2-3				
Do.....	2.75	13				
Do.....	3.25	25				
Laconia.....	2.60	2-3				
Madison b.....	2.51	2-3				
Marengo.....	4.50	2-3				
Iowa.						
Cresco.....	3.08	5-6				
Independence.....				1.30	1 10	1
Kentucky.						
Caddo.....	3.00	3				
Catlettsburg.....	2.93	14				
Louisa.....	2.54	14				
Louisville.....	2.63	2-3				
Paducah.....	2.50	2-3				
Princeton.....	2.87	2				
Louisiana.						
Covington.....	2.50	1-2				
Grand Coteau.....	2.51	5				
Lake Charles.....				1.60	1 30	1
Do.....				1.00	1 00	5
New Orleans.....	2.75	1-2				
Schriever.....				1.14	0 45	5
Shell Beach.....				1.40	1 00	5
Sugar Experimental Station.....	4.47	1-2		1.80	1 30	5
Thibodeaux.....				1.12	1 00	5
West End.....	4.25	1-2				
Maine.						
Cornish.....	3.30	23-24				
Gardiner.....	2.88	23-24				
Lewiston.....	3.82	23-24				
Portland.....	3.19	23-24				
Maryland.						
Bachmans Valley.....	3.45	13-14				
Fallston.....	2.53	13				
Fenby.....	3.60	13-14				
Great Falls.....	2.60	13-14				
McDonogh.....	3.53	13-14				
Valley Lee.....	3.00	23				
Woodstock.....	3.60	13-14				
Massachusetts.						
Long Plain.....	2.99	23-24				
Mansfield.....	2.54	23-24				
Michigan.						
Alpena.....	2.78	13-14				
Ann Arbor.....	2.60	2-3				
Ball Mountain.....	2.74	3-4				
Benton Harbor.....	2.55	2-3				
Berlin.....	2.66	3				
Detroit.....	2.58	3-4				
Thornville.....	2.65	3				
Minnesota.						
Blooming Prairie.....	3.00	5				
Mississippi.						
Biloxi.....	8.00	1-2				
Logtown.....	5.34	1-2				
Moss Point.....	3.00	2				
Missouri.						
Gordonville.....	2.81	12				
Sarcoixie.....				1.90	1 30	1
New Hampshire.						
Belmont.....	2.73	23-24				
Durham.....	3.30	23-24				
East Canterbury.....	3.02	23-24				
Sanbornton.....	2.59	23-24				
Weirs Bridge.....	2.50	23-24				
New Jersey.						
Hightstown.....	3.01	27-28				
Moorestown.....	2.76	27-28				
Newark a.....	2.55	23-24				
Paterson.....	2.78	23-24				
Perth Amboy.....	2.50	27				

Table of excessive precipitation—Continued.

State and station.	Monthly rainfall in inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
<i>New Jersey—Continued.</i>		<i>Inches.</i>	<i>Inches.</i>	<i>Inches</i>	<i>h. m.</i>	
South Orange		2.87	22-23			
Tenafly		2.74	23			
<i>New York.</i>						
New York.....		2.56	22-23			
<i>North Carolina.</i>						
Asheville		3.17	12-13			
Blowing Rock.....		4.71	12-13			
Charlotte.....		4.57	21-22			
Columbus	11.31	5.62	13-14			
Do.....		3.41	22			
Flat Rock		4.12	13			
Greensboro.....		2.50	21			
Henderson.....		2.80	12-13			
Lenoir.....		3.00	12-13			
Lewiston.....		5.02	21-22			
Lumberton.....		4.27	12-13			
Marion.....		3.30	13			
Do.....		2.87	22			
Morganton.....	10.70	5.00	13			
Do.....		3.00	22			
Mount Pleasant.....		2.58	12-13			
Rutherford College.....		3.31	13			
Shelby.....		2.50	22			
Tarboro.....		2.77	21-22			
Weldon.....		3.32	21-22			
<i>Ohio.</i>						
Akron.....		3.04	13-14			
Athens.....		4.50	13			
Bement.....		2.66	13-14			
Bissell.....		2.97	13-14			
Cadiz.....		3.70	13			
Cambridge.....		4.50	13			
Canton.....		3.40	13-14			
Carrollton.....		2.48	13-14			
Coalton.....		2.80	13			
Colebrook.....		3.48	14			
Dayton.....		2.54	3			
Demos.....		3.50	13-14			
Garrettsville.....		3.29	13-14			
Gratiot.....		3.20	13-14			
Green Hill.....		3.50	13			
Hanging Rock.....		2.50	13			
Harbor.....		3.39	14			
Hillhouse.....		5.00	13-14			
Hiram.....		3.25	14			
Logan.....		3.93	13			
Lordstown.....		3.47	13			
McConnellsville.....		3.96	13			
Marletta a.....		2.54	13-14			
Marletta b.....		2.80	13-14			
Milligan.....		3.56	13-14			
Millport.....		3.24	13			
Mountville.....		4.15	13-14			
Nelsonville.....		3.36	13			
New Alexandria.....		2.75	13-14			
New Comerstown.....		2.78	13			
Portsmouth a.....		3.58	13-14			
Portsmouth b.....		3.53	13-14			
Ridge.....		3.65	13			
Rittman.....		3.07	14			
Tiffin.....		2.93	3			
Vanceburg.....		2.50	13			
Warren.....		3.27	13			
Weymouth.....		2.88	13-14			
Zanesville.....		4.20	13-14			
<i>Oregon.</i>						
Aurora (near)		3.20	7			
Bandon.....	11.38	2.71	8			
Gardiner.....		3.43	8			
Glenora.....	16.57	3.87	7			
Hood River (near)		4.14	8			
Hubbard.....		3.74	7			
Langlois.....		2.95	8			
Mount Angel.....		3.11	7			
Newport.....		2.70	8			
Oregon City.....		2.75	7			
Springbrook.....		2.93	7			
Toledo.....		3.75	7			
Vernonia.....		2.56	7			
<i>Pennsylvania.</i>						
Beaver Dam.....		3.44	13-14			
Kilmer.....		3.15	13-14			
Le Roy.....		2.60	13-14			
New Castle.....		3.63	13-14			
Swarthmore.....		3.00	22-23			
<i>Rhode Island.</i>						
Providence a.....		2.96	23-24			
Providence c.....		3.06	23-24			
<i>South Carolina.</i>						
Blacksburg.....		2.82	21-22			
Brewer Mine.....		2.75	13			
Do.....		3.31	22			
Charleston.....		2.83	3-4	1.35	0 18	3
Do.....		4.52	12-13			
Connors.....		4.52	12-13			
Cross Hill.....		3.60	13			
Effingham.....		3.13	12-13			
Florence.....		2.89	12-13			
Georgetown.....		3.37	13			
Greenville.....		2.81	12-13			

Table of excessive precipitation—Continued.

State and station.	Monthly rainfall in inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
<i>South Carolina—Continued.</i>		<i>Inches.</i>		<i>Inches.</i>	<i>h. m.</i>	
Hardeeville		2.62	3			
Do		5.38	12-13			
Martins		2.65	12-13			
Nichols		4.88	12-13			
Pinopolis		2.75	3			
Do		4.22	12-13			
Rort Poyal		3.34	12-13			
Saint Georges		3.61	12-13			
Saint Stephens		3.16	12-13			
Santuck		3.75	12-13			
Simpsonville		3.41	13			
Society Hill		2.73	12-13			
Statesburg		2.34	12-13			
Trenton		3.08	12-13			
Trial		3.71	12-13			
Waterree		2.65	3-4			
Do		2.97	12-13			
Watts		3.49	12-13			
Yorkville		3.60	22-23			
Youngs Island		4.48	12-13			
<i>Texas.</i>						
Llano		3.09	1-2			
<i>Virginia.</i>						
Ashland		2.69	13-14			
Avon	12.61	6.00	13-14			
Do		3.22	21-22			
Big Stone Gap		2.90	13			
Christiansburg		3.20	12-13			
Riverton		3.60	13-14			
Salem		2.51	12-13			
Saluda		5.40	22			
Spottsville		3.39	22			
Stanardsville		3.48	13			
Staunton		2.86	13			
Stephens City		2.53	13-14			
Warsaw		3.05	23			
Woodstock		2.72	13			
Wytheville		2.95	13			
<i>Washington.</i>						
Neah Bay	11.44					
Pine Hill		3.30	7			
Pysht		2.51	10-11			
<i>West Virginia.</i>						
Bluefield		3.16	13			
Harpers Ferry		3.10	13-14			
Huntington		3.70	13			
Parkersburg		3.08	13-14			
Point Pleasant		3.20	13-14			
Sandyville		2.69	13			
<i>Wisconsin.</i>						
Ashland		3.10	6			
Estella		2.79	5-6			
Hayward		2.60	5-6			
Osceola		2.60	5-6			
Sharon		3.00	2			

Received too late for publication in September, 1893.

<i>Mississippi.</i>						
Palo Alto		2.53	25			
<i>Nebraska.</i>						
Red Cloud		2.57	29-30			
<i>North Carolina.</i>						
Marion		4.20	11			

MAXIMUM RAINFALL IN ONE HOUR OR LESS.

The following table is a record of the heaviest rainfall during October, 1893, for periods of five and ten minutes and one hour, as reported by regular stations of the Weather Bureau furnished with self-registering gauges:

Station.	Maximum fall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	Inch.		Inch.		Inch.	
Atlanta, Ga.	0.06	13	0.08	13	0.05	3
Baltimore, Md.					0.37	13
Bismarck, N. Dak.					0.05	3
Boston, Mass.	0.09	24	0.15	24	0.43	24
Buffalo, N. Y.						
Cincinnati, Ohio	0.05	3	0.10	3	0.25	3
Chicago, Ill.						
Cleveland, Ohio	0.15	15	0.25	15	0.29	15
Denver, Colo.					0.05	11
Detroit, Mich.	0.20	3	0.31	3	0.82	3
Dodge City, Kans.	0.03	1	0.05	1	0.15	1
Duluth, Minn.	0.03	6	0.05	6	0.20	6
Eastport, Me.	0.08	7	0.16	7	0.43	7
Galveston, Tex.	0.13	6	0.22	6	0.35	6
Indianapolis, Ind.	0.17	2	0.24	2	0.48	2

Maximum rainfall in one hour or less—Continued.

Station.	Maximum fall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
Jacksonville, Fla. †	Inch.		Inch.		Inch.	
Jupiter, Fla.	0.06	12	0.09	12	0.27	12
Kansas City, Mo. *	0.25	24	0.45	24	2.05	24
Key West, Fla.	0.23	19	0.37	19	10.80	19
Marquette, Mich. †	0.05	12	0.06	12		
Memphis, Tenn.	0.03	6	0.05	6	0.10	6
Milwaukee, Wis.	0.07	13	0.12	13	0.45	13
Nashville, Tenn.	0.15	27	0.25	27	0.60	27
New Orleans, La. †	0.06	22	0.09	22	0.27	22
New York, N. Y.	0.05	7	0.10	7	0.42	7
Norfolk, Va. †	0.15	7	0.22	7	0.43	7
Olympia, Wash.	0.03	14	0.06	14	0.27	14
Omaha, Nebr. *	0.08	23	0.12	23	0.40	24
Philadelphia, Pa.	0.06	6	0.11	6	0.35	6
Pittsburg †	0.03	12	0.05	12	0.23	12
Rochester, N. Y.	0.06	5	0.10	5	0.22	5
Portland, Me.	0.01	22	0.02	22	0.09	22
Portland, Oregon.	0.08	3	0.63	3	1.52	3
Saint Louis, Mo.	0.03	10	0.05	10	0.11	10
Saint Paul, Minn.	0.30	20	0.40	20	0.70	20
Salt Lake City, Utah	0.27	6	0.46	6	0.64	6
San Diego, Cal.	0.05	13	0.10	13	0.45	13
San Francisco, Cal. *	0.10	21	0.18	21	0.43	21
Savannah, Ga. †						
Spokane, Wash.						
Tampa, Fla.						
Vicksburg, Miss.						
Washington, D. C.						
Wilmington, N. C. †						

* Less than 0.05 in 1 hour. † Self-register out of order. ‡ Record incomplete.

The following tables show the number of years for which monthly precipitation to equal or exceed 10.00 inches, daily precipitation to equal or exceed 2.50 inches, and hourly precipitation to equal or exceed 1.00 inch has been reported in the several states and territories for October during the last 24 years:

Excessive monthly precipitation.

State.	No. years noted.	State.	No. years noted.
Florida.....	14	Kansas.....	1
Texas.....	10	Kentucky.....	1
North Carolina.....	8	Maine.....	1
Oregon.....	6	Mississippi.....	1
Washington.....	6	New Jersey.....	1
Georgia.....	5	Ohio.....	1
New Hampshire.....	4	Rhode Island.....	1
Louisiana.....	4	Tennessee.....	1
New York.....	4	Arizona.....	0
California.....	4	Colorado.....	0
Michigan.....	3	The Dakotas.....	0
Virginia.....	3	Delaware.....	0
Maryland.....	2	Idaho.....	0
Missouri.....	2	Minnesota.....	0
South Carolina.....	2	Montana.....	0
Massachusetts.....	2	Nebraska.....	0
Alabama.....	1	Nevada.....	0
Arkansas.....	1	Pennsylvania.....	0
Connecticut.....	1	Utah.....	0
District of Columbia.....	1	Vermont.....	0
Illinois.....	1	West Virginia.....	0
Indiana.....	1	Wisconsin.....	0
Indian Territory.....	1	Wyoming.....	0
Iowa.....	1	New Mexico.....	0

Excessive daily precipitation (24 hours).

Florida.....	18	Ohio.....	6
North Carolina.....	16	Indian Territory.....	5
Texas.....	16	Oregon.....	5
Louisiana.....	14	Wisconsin.....	5
Georgia.....	13	Arkansas.....	4
Kansas.....	11	Tennessee.....	4
Illinois.....	11	The Dakotas.....	4
Pennsylvania.....	11	Kentucky.....	4
New York.....	11	Minnesota.....	4
South Carolina.....	10	New Hampshire.....	4
Alabama.....	9	Washington.....	4
Maryland.....	9	Indiana.....	3
Missouri.....	9	California.....	2
Rhode Island.....	9	West Virginia.....	2
Massachusetts.....	9	New Mexico.....	1
Virginia.....	9	Utah.....	1
Maine.....	8	Vermont.....	1
Connecticut.....	8	Delaware.....	1
New Jersey.....	8	Montana.....	1
Nebraska.....	7	Wyoming.....	1
Mississippi.....	7	Arizona.....	0
Iowa.....	7	Colorado.....	0
District of Columbia.....	6	Idaho.....	0
Michigan.....	6	Nevada.....	0

Excessive hourly precipitation.

State.	No. years noted.	State.	No. years noted.
Texas.....	10	Arizona.....	0
Iowa.....	6	California.....	0
Florida.....	5	Colorado.....	0
Kansas.....	4	Delaware.....	0
North Carolina.....	4	Idaho.....	0
Illinois.....	4	The Dakotas.....	0
Louisiana.....	4	Kentucky.....	0
Nebraska.....	3	Maine.....	0
Georgia.....	3	Massachusetts.....	0
Alabama.....	2	Michigan.....	0
District of Columbia.....	2	Minnesota.....	0
Indiana.....	2	Montana.....	0
Missouri.....	2	Nevada.....	0
South Carolina.....	2	New Hampshire.....	0
Arkansas.....	1	New Mexico.....	0
Connecticut.....	1	Oregon.....	0
Indian Territory.....	1	Rhode Island.....	0
Maryland.....	1	Tennessee.....	0
Mississippi.....	1	Utah.....	0
New Jersey.....	1	Virginia.....	0
New York.....	1	Vermont.....	0
Ohio.....	1	Washington.....	0
Pennsylvania.....	1	West Virginia.....	0
Wisconsin.....	1	Wyoming.....	0

The following tables give exceptionally heavy monthly, daily, and hourly precipitation reported for October during the last 24 years:

Monthly.

Station and state.	Am't.	Year.	Station and state.	Am't.	Year.
Reidsville, N. C.	Inches.		Mayport, Fla.	Inches.	
Sims, Cal.	29.09 [†]	1885		20.03	1880
	28.57	1889			

Daily (24 hours).

Station and state.	Amount.	Date.	Station and state.	Amount.	Date.
Fernandina, Fla.	Inches.		Jupiter, Fla.	Inches.	
Bracketville, Tex.	13.14	20-21, 1882	Fort Meade, Fla.	5.95	10-11, 1892
Saint Augustine, Fla.	13.08	1-2, 1881	Amelia, Fla.	5.75	9, 1891
Key West, Fla.	10.31	9-10, 1880	Evergreen, Ala.	5.67	1, 1891
Newport, Fla.	9.24	20-21, 1883	Columbus, N. C.	5.63	3, 1893
Biloxi, Miss.	8.20	8, 1876	Logtown, Miss.	5.62	13-14, 1893
Galveston, Tex.	8.00	1-2, 1893	Saltida, Va.	5.34	1-2, 1893
Mobile, Ala.	7.77	2, 1871	Jacksonville, Fla.	5.40	22, 1893
Fort Robinson, Nebr.	7.47	1-2, 1893	Abbeville, La.	5.15	1, 1890
Birdsneat, Va.	7.07	23, 1887	New Bedford, Mass.	5.15	23-24, 1890
Lawrence, La.	6.85	7-8, 1891	Trial, S. C.	5.08	21, 1890
Avon, Va.	6.00	22, 1892	Jordan's Grove, Ill.	5.02	22-23, 1890
Gainesville, Tex.	6.00	13-14, 1893	Morganton, N. C.	5.00	11-12, 1893
Brewton, Ala.	5.98	21-22, 1892	Hillhouse, Ohio.	5.00	13, 1893
	5.95	2, 1893			

One hour and less.

Station and state.	Amount.	Time.	Date.
Savannah, Ga.	Inches.		
Jupiter, Fla.	0.38	0 05	3, 1893
Do.	0.35	0 05	7, 1892
Savannah, Ga.	0.35	0 05	10, 1892
Key West, Fla.	0.35	0 05	22, 1890
Tampa, Fla.	0.35	0 05	9, 1891
Cleveland, Ohio.	0.30	0 05	20, 1893
Galveston, Tex.	0.30	0 05	13, 1890
Jupiter, Fla.	0.30	0 05	1, 1890
Key West, Fla.	0.30	0 05	10, 1890
New Orleans, La.	0.30	0 05	15, 1890
Washington, D. C.	0.28	0 05	19, 1891
Vicksburg, Miss.	0.27	0 05	6, 1893
Jupiter, Fla.	0.25	0 05	24, 1893
Brownsville, Tex.	1.20	0 06	23, 1884
Savannah, Ga.	0.63	0 10	3, 1893
Jupiter, Fla.	0.60	0 10	7, 1892
Charleston, S. C.	1.35	0 18	3, 1893
Fort Scott, Kans.	1.80	0 20	2, 1881
Cresco, Iowa.	1.11	0 20	10, 1878
Galveston, Tex.	2.12	0 25	30, 1877
Abilene, Tex.	1.50	0 25	24, 1885
Des Moines, Iowa.	2.30	0 30	15, 1880
Titusville, Fla.	2.60	0 50	12, 1892

MONTHLY SNOWFALL.

The depth of snowfall during the month of October, as re-

ported by both regular and voluntary observers, is shown by the figures on Chart VI, which also gives, by the full line, the limit at which minimum temperatures of 32° F. were at any time reported at the regular Weather Bureau stations; by the dotted line is given a similar limit for 40°. These air temperatures within Weather Bureau shelters are, of course, higher than would be given by thermometers exposed in the open air. The line of 40° within a shelter usually marks the limit of frosts on the open surface of the ground.

Monthly snowfalls of 1 inch or more occurred on mountain tops of the Sierra Nevada and over the greater part of Colorado, Wyoming, Idaho, eastern Oregon, western Nebraska, North Dakota, South Dakota, Upper Michigan, and the north-western portion of New York state, and were reported as follows; in states and territories where the maximum depth was below 1 inch the station reporting the greatest is given:

Snowfall of one inch or more, October, 1893.

State and stations.	Inches.	State and stations.	Inches.
Arizona.		New Hampshire.	
Flagstaff	0.8	Bethlehem	Trace.
California.		Hanover	Trace.
Cisco	1.0	Stratford	Trace.
Summit	3.0	West Milan	Trace.
Colorado.		New Jersey.	
Breckenridge	21.5	Boonton	Trace.
Climax	30.0	Rancocas	Trace.
Como (near)	3.0	Salem	Trace.
Deer Trail	3.0	New Mexico.	
Denver	5.8	Monero	1.0
Dumont	4.0	New York.	
Gold Hill	13.5	Alfred Center	4.0
Husted	1.0	Angelica	2.5
La Jara	1.0	Arcade	1.8
Lay	4.0	Baldwinville	2.0
Moraine	5.0	Brookfield	1.0
Pagoda (near)	8.0	Friendship	2.4
Pikes Peak	34.8	Humphrey	8.3
Red Cliff	16.5	Lowville	3.0
Rico	2.3	Madison Barracks	1.2
River Bend	1.0	Number Four	8.0
Saint Cloud	3.0	Oswego	4.0
Seibert	2.0	Palermo	1.2
Smoky Hill Mine	12.0	South Canisteo	1.9
Stamford	1.5	Turin	2.1
Steamboat Spring	7.0	North Dakota.	
Table Rock	4.0	Bottineau	1.0
Thon	5.5	Churchs Ferry	1.0
Watkins	2.0	Forman	2.0
Connecticut.		Fort Buford	2.5
Canton	Trace.	Fort Stevenson	1.0
Idaho.		Gallatin	1.0
Bonanza City	5.0	Kelso	3.0
Grangeville	6.0	Larimore	1.5
Indiana.		Power	1.5
Hawpach	Trace.	Wahpeton	2.0
Seymour	Trace.	Wild Rice	2.0
Iowa.		Woodbridge	5.0
Logan	1.0	Ohio.	
Kansas.		Cleveland (V.O.)	1.1
Concordia	Trace.	Wheeler	1.0
Wakefield	Trace.	Oregon.	
Whitita	Trace.	Joseph	8.0
Maine.		Siskiyou	1.5
Houlton	Trace.	Pennsylvania.	
Mayfield	Trace.	Erie	1.5
Maryland.		Smethport	2.0
Oakland	Trace.	Wellsboro	1.0
Sunnyside	Trace.	South Dakota.	
Michigan.		Ashcroft	2.5
Alpena	1.2	Bear Valley	4.0
Calumet	1.0	Cross	4.3
Charlevoix	1.0	Faulton	2.2
Cheboygan	1.0	Forest City	2.0
Gaylord	7.5	Fort Meade	3.4
Lodi	1.0	Frankfort	1.5
Marquette	4.8	Gary	1.0
Rockland	1.0	Mellette	2.0
Minnesota.		Northville	2.0
Ada	1.5	Spearfish	7.0
Moorhead	1.1	Webster	1.5
Morris	1.0	Whitewood	3.5
Park Rapids	2.0	Utah.	
Saint Oloff	1.0	Parowan	0.5
Wadena	1.0	Vermont.	
Missouri.		Northfield	0.1
Platte River	Trace.	Port Crescent	0.5
Montana.		West Virginia.	
Fort Missoula	3.8	Weston	Trace.
Hayre	5.1	Wheeling	Trace.
Helena	1.8	Wisconsin.	
Miles City	1.7	Crandon	2.0
Nebraska.		Florence	2.0
Hay Springs	1.0	Koepenick	1.0
Kearney	1.5		
West Point	1.0		
Nevada.			
Stoffel	0.6		

Snowfall of one inch or more—Continued.

State and stations.	Inches.	State and stations.	Inches.		
<i>Wyoming.</i>		<i>Wyoming—Continued.</i>			
Camp Pilot Butte	1.5	Laramie.....	1.0		
Cheyenne	2.0	Saratoga	14.3		
Fort Yellowstone	5.9	Sundance	1.0		
Lander	2.2				
<i>Depth of snow on ground on the 15th and at the close of the month.</i>					
State and stations.	15th.	31st.	State and stations.	15th.	31st.
<i>Colorado.</i>			<i>Nevada.</i>		
Breckenridge	0.0	Trace.	Virginia City	0.2	0.0
Climax.....	0.0	3.0	<i>New York.</i>		
<i>Michigan.</i>			Arcade	0.0	Trace.
Evart	Trace.	0.0	Brookfield	0.5	0.0
Gaylord	4.0	Trace.	Lowville.....	0.0	2.0
Marquette	0.0	0.3	Palermo	0.0	Trace.
<i>Minnesota.</i>			South Canisteo	0.0	Trace.
Sank Center	0.0	Trace.	Turin	0.0	Trace.
<i>Montana.</i>			<i>South Dakota.</i>		
Hayre	0.0	0.1	Ashcroft	0.0	1.5
Helena.....	0.0	Trace.	<i>Wisconsin.</i>		
			Crandon	0.0	0.5

HAIL.

Description of the more severe hailstorms reported for the month is given under "Local storms."

Hail was reported as follows: 1st, Texas. 2d, Idaho, Texas, and Washington. 3d, Washington. 4th, Colorado and Idaho. 5th, Missouri and Wisconsin. 6th and 7th, Washington. 9th, California, Maine, New Hampshire, and Oregon. 10th, Oregon and Washington. 11th, Kansas, Minnesota, and Wisconsin. 14th, Maryland, Ohio, and West Virginia. 15th, California and West Virginia. 17th, North Dakota. 20th, Ohio, West Virginia, and Wisconsin. 21st, South Carolina. 23d, New York. 25th, Colorado, Illinois, North Dakota, and Wisconsin. 26th, Kentucky. 27th, New York. 29th, Massachusetts. 31st, Washington.

SLEET.

Sleet was reported as follows: 1st, Colorado and North Dakota. 3d, Wyoming. 5th, Colorado. 10th, Nevada. 11th, Colorado, Minnesota, Nebraska, and South Dakota. 12th, Kansas and Wisconsin. 14th, Michigan, New York, and Ohio. 15th, New York. 17th, Montana. 18th, North Dakota. 22d, Nevada. 23d, Minnesota, North Dakota, and South Dakota. 25th, Colorado, Minnesota, and Texas. 26th, Texas and Wisconsin. 27th, Minnesota. 28th, Michigan, New York, Ohio, South Dakota, and West Virginia. 29th, New Hampshire, New York, Ohio, Vermont, and Wyoming. 30th, New Hampshire and Vermont. 31st, Oregon, Vermont, and Washington.

DRY SEASONS.

In connection with the deficits of precipitation above mentioned the following reports of droughts affecting wells, pasturage, etc., at the end of the month have been received:

Alabama.—Valley Head, drought still continues, many wells and springs are dry, and water for stock is scarce.

Louisiana.—At the close of the month all portions of the state were in need of rain; stock water is scarce; in many sections pasturage has failed entirely; fall gardening and planting are greatly retarded.

Missouri.—The month was very dry, stock water scarce; many localities report the wheat injured by drought.

Tennessee.—Fields intended for winter wheat remain unseeded, as the soil is too dry to plow, and when sown the seed germinates badly for lack of moisture; water for stock is scarce.

Arizona, Oklahoma, Indian Territory, Kansas, Nebraska.—The month has been very dry.

New Mexico.—Halls Peak, the driest October on record; Galinas Spring, very dry.

Texas.—Brady, drought still continues and is becoming very

severe; stock water and wells are failing and the range is almost destitute of grass. Brazoria and Burnet, the month was very dry. At Hallettsville the month was the driest on record. At Sulphur Springs water is very scarce and wells are failing for the first time in years.

WET SEASONS.

In connection with the regions of heavy rain shown on

Chart III the following reports affecting the crops have been received:

Oregon.—Langlois, excessive and continuous rains damaged the late grain. At Mount Angel the month was the wettest October on record, the excess being 3.08 above the normal, and was very unfavorable to all crops.

Washington.—Colfax, this month is the wettest October in many years; two-thirds of the grain is ruined.

WIND.

The prevailing winds in October, 1893, viz., those that were recorded the most frequently, are shown on Chart II by arrows flying with the wind. Northeasterly winds prevailed in the south Atlantic and Gulf states; southeasterly winds in the Ohio Valley, Lakes Michigan and Huron, Missouri, and central Texas; northwest winds in Nebraska, North and South Dakota, Manitoba, Assiniboia, and Saskatchewan; southwest and northwest winds at the Rocky Mountain and Pacific coast stations, New York, and New England.

HIGH WINDS. (In miles per hour.)

Wind velocities of 50 miles, or more, per hour were reported at regular stations of the Weather Bureau as follows:

2d, 72, se., at Mobile, Ala.; 66, sw., at Pensacola, Fla. 3d, 51, nw., at Huron, S. Dak. 4th, 55, ne., at Kittyhawk, N. C.; 54, n., at Hatteras, N. C. 5th, 60, nw., at Shreveport, La.; 60, s., at Fort Canby, Wash.; 56, n., at Amarillo, Tex. 6th, 60, sw., at Chicago, Ill. 7th, 70, s., at Fort Canby, Wash. 11th, 90, s., at Fort Canby, Wash.; 72, w., at Jupiter, Fla.; 70, n., at Titusville, Fla.; 61, se., at Tatoosh Island, Wash.; 60, n., at Amarillo, Tex. 12th, 60, ne., at Charleston, S. C. 13th, 94, se., at Southport, N. C.; 58, se., at Kittyhawk, N. C.; 56, se., at Wilmington, N. C.; 56, e., at Charleston, S. C.; 55, se., at Philadelphia, Pa. 14th, 63, se., at New London, Conn.; 61, sw., at Buffalo, N. Y.; 60, s., at Northfield, Vt.; 56, se., at Oswego, N. Y.; 50, se., at Woods Holl, Mass., and New Haven, Conn.; 50, nw., at Grand Haven and Sault Ste. Marie, Mich. 15th, 59, sw., at Buffalo, N. Y. 22d, 54, se., at Kittyhawk, N. C.; 23d, 80, w., at Pikes Peak, Colo.; 55, nw., at Colorado Springs, Colo. 26th, 56, s., at Chicago, Ill. 28th, 52, nw., at Cleveland, Ohio.

LOCAL STORMS.

1st.—(For some account of the damage to property and loss of life by the Gulf hurricane of October 1st–3d, see "low area" No. III, p. 272.)

2d.—Thunderstorms prevailed in Lower Michigan, Wisconsin, and Iowa. A man and a horse were killed by lightning at Stockton, Wis.; a barn was struck by lightning and burned at Caledonia, Wis.; a house was struck by lightning at Davenport, Iowa, in the early morning and damaged to the extent of \$1,500 (estimated).

4th.—Heavy rains and high winds occurred along the North Carolina and Virginia coasts. The Weather Bureau observer at Norfolk, Va., reports that 2 vessels went ashore near Virginia Beach, vessels a total loss. High southeast backing to northeast winds prevailed at Kittyhawk, N. C., during the forenoon and afternoon, with a maximum velocity of 55 miles per hour; a vessel was wrecked near that point.

During a high south wind at Hatteras, N. C., 2 men were drowned in the Sound near by.

High winds and heavy surf prevailed along the Washington and Oregon coasts. A vessel was wrecked 30 miles south of Tatoosh Island, and 6 persons were drowned. The vessel, valued at \$15,000, was a total loss.

5th.—A violent thunderstorm passed over Shreveport, La.,

between 8.15 and 9.40 p. m. The wind reached a maximum velocity of 60 miles per hour. A house was struck by lightning, and considerable damage was done by high wind.

6–7th.—Severe gales prevailed over the Great Lakes and the Mississippi Valley. High winds at Toledo, Ohio, on the 6th caused the water in the river to run out to such an extent that a barge went aground; above the city the water was said to be the lowest on record.

Three schooners were reported wrecked, and a number of accidents to shipping of a minor character were reported.

9th.—During a heavy thunderstorm which passed over Gardiner, Me., 4 houses were struck by lightning, one in Gardiner, and 3 in adjoining towns.

11th.—Severe gales and heavy rain prevailed over northwest Washington. At Tatoosh Island the wind attained a maximum velocity of 61 miles per hour from the southeast, accompanied by rain and a very heavy sea swell.

The following notes are supplementary to the general report of the storm of October 11–14, p. 273:

At Saint Augustine, Fla., the waters of the Matanzas and the San Sebastian rivers were united, a phenomenon that has not occurred since the great flood of 22 years ago. The tide rose about 12 inches over the sea wall. All telegraph and telephone lines were prostrated, many houses flooded, the cypress blocks of the street pavement floated away, and railroad traffic totally suspended. The tide during this storm rose higher than any known since 1824, and as the city was not guarded by a sea wall the present high water must be considered as the highest known. At Jacksonville, Fla., a high wind prevailed, with rain, all day of the 12th, causing damage to some cottages and bringing up the water of the Saint Johns River higher than known for years.

Savannah, Ga., reported damage of a minor character, wind reached 40 miles and sea ran heaviest for years.

At Charleston, S. C., the wind reached 60 miles, but no damage done to shipping interests.

Georgetown, S. C., was probably the worst sufferer of all stations along the coast. The wind is estimated to have reached a velocity of about 90 miles from the northeast at 9 a. m. of the 13th; died to calm at 10 a. m., and rose to about 60 miles from west by 11 a. m., gradually falling as the day passed. The high tide exceeded that of the great storm of August of this year by from 10 to 28 inches, and although the reports of lives lost are somewhat conflicting a conservative estimate places the total at fifteen.

At Southport, N. C., the wind reached a maximum velocity of 94 miles from the south on 13th, wharves were damaged, and a three-masted schooner went ashore.

At Louisburg, N. C., one life was lost.

At Wilmington, N. C., a heavy gale set in early on the 13th and rain continued throughout the day, maximum velocity of wind being 56 miles. The tide was highest ever recorded, exceeding previous highest tide by 16 inches. Some vessels were lost and much damage done; all low lands submerged.

At Raleigh, N. C., large trees were uprooted and cotton damaged severely. Hatteras, N. C., reports barkentine "Ravenscraft" went ashore. At Norfolk, Va., wires blown down. At Spottsville and Ashland, Va., crops were damaged. At Washington, D. C., the wall of a church in course of erection was blown down.

In Baltimore, Md., the rain began in the forenoon continuing to fall heavily at intervals until the early morning of the 14th. The wind reached a high velocity blowing the wire of the Brush Electric Co., in contact with the wooden portion of the building and causing a loss by fire of \$125,000 and the death of two prisoners in the city jail, an adjoining building, by suffocation. Tide in harbor higher than for a number of years and many wharves and bridges were swept away. Solomons and Woodstock, Md., also report great damage to property.

At Philadelphia, Pa., the wind reached a velocity of 50 miles, with gusts of 60 miles during the afternoon of the 13th, continuing to early morning of the 14th. Some slight damage done by wind; tide unusually high.

The storm was felt at Chester, Stroudsburg, Westtown, Lewisburg, Kil-